UNINTENDED CONSEQUENCES OF A GRANT REFORM: HOW THE ACTION PLAN FOR THE ELDERLY AFFECTED THE BUDGET DEFICIT AND SERVICES FOR THE YOUNG

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Abstract

The Action Plan for the Elderly (APE) was implemented by the Norwegian parliament in 1997 to increase capacity and improve service standards within the care for the elderly sector. Care for the elderly is a local government responsibility, and the main financial element in APE was a temporary investment grant of a matching type to the local authorities. This type of grant is likely to have adverse effects for other services and the budgetary balance. We investigate empirically whether APE had such adverse effects. There is evidence that APE reduced the growth in child care coverage and increased the budget deficit.

Keywords: Grant reform; Unintended consequences; Local public services; Budget deficit
JEL classification: H72, H77

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1. Introduction

In June 1997 the Norwegian parliament decided to implement an Action Plan for the Elderly (APE) in order to increase capacity and improve service standards within the care for the elderly sector. Care for the elderly is a local government responsibility, and the main financial element in APE was a temporary investment grant of a matching type to the local authorities. The purpose of this study is to investigate whether APE had unintended consequences for the budget deficit and services for the young.

The investment grant in APE differs from the typical matching grant in the literature on intergovernmental grants. First, since it is related to investments it represents a subsidy of new capacity and new production. The investment grant does not change the local costs of existing production. Second, since the grant is temporary it affects the intertemporal prices. Investments during the action plan period become relatively less costly than investments before and after.

The design of the investment grant is motivated by a desire to achieve a large impact on capacity and service provision in the care for the elderly sector relatively to the grant amount. However, the desire of a high impact-amount ratio is also likely to produce unintended effects. First, since the grant only subsidizes new capacity and new production "leakage" to other sectors is not an issue. The effect may rather be the opposite as local governments must reallocate resources from other sectors to care for the elderly in order to take advantage of the grant program. Second, since the grant is temporary it provides incentives for local governments to reallocate resources over time. More precisely, resources will be reallocated towards the action plan period. This intertemporal effect tends to weaken the budgetary balance in the action plan period.

The rest of the paper is organized as follows: Section 2 gives a description of APE. We pay particular attention to the investment grant and describe the variation in utilization of APE across local governments. Section 3 discusses empirical strategy and data. The empirical strategy is to identify the effect of APE by using a difference-in-differences approach that makes use the variation in utilization of APE. In this way the paper is linked to an empirical literature that aims at identifying the causal effect of grant, e.g. Knight (2002), Baicker and Gordon (2006), Gordon (2004), Dahlberg et al. (2008), and Borge et al. (2015). As indicators

of service provision in other sectors we use child care coverage and teachers hours per pupil in education. The budgetary balance is described by gross and net operating surplus. The empirical results are presented in Section 4. Our main findings are that APE reduced the growth in child care coverage and increased the budget deficit. Finally, Section 5 offers some concluding remarks.

2. The Action Plan for the Elderly (APE)

In June 1997 the Norwegian parliament decided to implement an Action Plan for the Elderly (APE) in order to increase capacity and improve service standards within the care for the elderly sector. The goals of the plan were to increase the number of man-years increase the number of dwellings for the elderly. Two types of dwellings were considered: specially adapted dwellings and dwellings in nursing homes. Specially adapted dwelling has the advantage that it offers great flexibility with respect to the amount of care. The level of care varies from a level similar to private homes to around the clock services as in nursing homes.

The two main financial means under the APE were grants related to current expenditures and investments. The grant related to current expenditures was distributed on the basis of objective criteria like age composition and standardized death rates. It had more or less the same impact as block grants and was included in the block grant system from 2002. In this paper we focus on the investment grant that was of the matching type. The investment grant was a fixed amount for respectively specially adapted dwellings and dwellings in nursing homes. By the start of the APE in 1998 the investment grant was NOK 175,000 (USD 32,000) for specially adapted dwellings and NOK 375,000 (USD 68,000) for nursing homes. The investment grant was not sufficient to cover the investment costs, and in addition to the investment grant local governments receive yearly grants to cover interest payments and debt service. The yearly grants are calculated on the basis of a projected investment cost of NOK 740,000 (USD 135,000) for specially adapted dwellings and NOK 840,000 (USD 153,000) for nursing homes.

Table 1: Number of dwellings with investment grant under APE

Year	1998	1999	2000	2001	2002	2003	Total
# of dwellings	5174	5326	5837	5977	5231	435	27980
# of dwellings nursing homes	1409	1565	2312	3208	2860	158	11512
# of specially adapted dwellings	3765	3761	3525	2769	2371	277	16468
# of local governments	211	206	192	171	165	30	415

Table 1 provides an overview of the number of dwellings with investment grant under APE. The figures include dwellings that were granted investment grant during 1998-2003 and that were finished by January 1, 2005. The 28,000 investment grants in Table 1 amounts to 73% of the total number of investment grants under APE. In our sample, around 40% of the investment grants were given to nursing homes and 60% to specially adapted dwellings.

Table 2: Utilization of APE

	Mean (unweighted)	Mean (weigted)	Standard deviation	Minimum	Maximum
Dwellings per 1000 inhabitants	9.12	7.05	3.80	0	38.66
Specially adapted dwellings per 1000 inhabitants	5.04	4.15	4.16	0	24.10
Dwellings in nursing homes per 1000 inhabitants	4.08	2.89	5.22	0	31.93

The purpose of the paper is to investigate whether APE has affected the budget deficit and other services. The identification is based on the fact that the utilization of APE varies across local governments. As indicator of utilization we use the number of investment grants per 1000 inhabitants. The variation in the utilization of APE is displayed in Table 2. It appears that the average local government received investment grant for 9 dwellings per 1000 inhabitant, of which 5 where specially adapted dwellings and 4 were nursing homes. For all three indicators the (population) weighted averages are lower than the weighted averages. This observation reflects that larger local governments have utilized APE less than smaller local governments. The variation in utilization of APE is substantial. A total of 18 local governments did not utilize APE at all in the sense that they received no investment grants. In the other end of the scale, the local government with highest utilization received investment grant for nearly 40 dwellings.

3. Empirical strategy and data

The empirical analysis is based on an approach where we analyze whether differences in utilization of APE can explain that local governments experienced different development of budget deficit and services for the young during 1997-2005. The strategy has the advantage that it controls for community specific effects and time specific effects that are common to all local governments.

The starting point is the following equation in levels

$$Y_{it} = \beta_t + \gamma \mathbf{X_{it}} + \alpha_i + \varepsilon_{it} \tag{1}$$

where Y_{it} is services for the young or budget deficit in local government i in periode t, $\mathbf{X_{it}}$ is a vector of controls, β_t is a time-specific constant term, α_i is a community specific term, and ε_{it} is an error term. Let t be 2005 and t-1 be 1997. By taking the first difference of equation (1), we get the following expression for the development from 1997 to 2005:

$$\Delta Y_{it} = (\beta_t - \beta_{t-1}) + \gamma \Delta \mathbf{X_{it}} + \Delta \varepsilon_{it} \tag{2}$$

where $\Delta Y_{it} = Y_{it} - Y_{it-1}$, etc. Equation (2) says that the change in services for the young or the budget deficits depend on the change in the controls. The empirical analysis is based on a modification of equation (2) where ΔY_{it} also depends on the utilization of APE:

$$\Delta Y_{it} = (\beta_t - \beta_{t-1}) + \gamma \Delta \mathbf{X_{it}} + \lambda_1 NH_i + \lambda_2 SAD_i + \Delta \varepsilon_{it} \tag{3}$$

We allow investment grants related to nursing homes (*NH*) and specially adapted dwellings (*SAD*) to have separate effects. The motivation is that investments in nursing homes and specially adapted dwellings may have very different fiscal effects for the local governments in the sense that they affect current expenditures differently. First, for specially adapted dwellings local governments are allowed to charge a rent that cover costs. Second, the residents of nursing homes receive around the clock service. Consequently, we expect

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investment in nursing homes to have the strongest effect on the budget deficit and services for the young. That is, we expect λ_2 to be less in absolute value than λ_1.

Services for the young include child care and primary and lower secondary education. As indicator of service production for child care we use the share of children 0-5 years of age that is in child care. For education we use the number of teacher hours per pupil as indicator of service provision. Basically one teacher hour is produced when one teacher teaches a class or a group for one hour.

The budgetary balance is measured by two indicators. The first is the net operating surplus, which is defined as current revenues less current expenditures, interest payments, and debt servicing costs. Since the investment grant only covers part of the investment costs, utilization of APE is associated with increased local government borrowing. Consequently, a negative effect of APE on the net operating surplus may just reflect that increased borrowing raises interest payments and debt servicing costs. Our second indicator of budgetary balance is thus the gross operating surplus. It is defined as current revenues less current expenditures and is not directly affected by the amount of borrowing. The operating surpluses are measured per capita in fixed 2005 prices.

As control variables we include local government revenues per capita and the age composition of the population. The revenue measure includes taxes and block grants. Since most local taxes are of the revenue sharing type, these revenues can be considered as exogenous. The age composition is captured by the share of children 0-5 years of age, the share of children 6-15 years of age, the share of elderly 67-79 years of age, and the share of elderly 80 years and above. The variables are mainly included to capture the demand for child care, education, and care for the elderly.

As a starting point equation (3) is estimated by ordinary least squares (OLS). Since the approach allows for community specific effects, we can rule out any simultaneity problem related to fixed factors that affect both *Y* and the utilization of APE. However, we cannot rule out that utilization of APE correlates with the change in omitted controls. We address this problem by instrumenting the utilization of APE by the share of elderly and the share of population in rural area. As the subsidy amounts are fixed we expect the effective matching

rates to vary across local governments depending on building costs. The utilization of APE correlates most likely with building costs, thus the share of population living in rural area may work as an instrument for the utilization of APE.

The empirical analyses are based on data for around 430 local governments. Except for a few missing observations, the data set includes all local governments not affected by consolidations during the period under study.

4. Estimation results

We start out by investigating how utilization of APE affects the care for the elderly sector. The goal for this action plan was to increase capacity and improve standards within the care for the elderly sector. In Table 5 we present analyzes where we investigate how utilization of APE affects spending per capita in elderly care, coverage in home based care and in institutions, and the share of single rooms in institutions. Coverage in home based care is measured as number of inhabitants receiving home based care per inhabitants above age 67, while coverage in institutions is measured as number of inhabitants receiving care in institutions per inhabitant above age 80.

The results in Table 3 indicate that coverage in home based care is unaffected by utilization of APE, while institution coverage is negatively affected by the degree of investments in specially adapted dwellings. One of the goals with APE was to increase the share of single rooms in institutions (improve standards). For the share of single rooms in institution, both utilization variables come out as highly significant and with a positive sign. Utilization of *NH* comes out with a positive and borderline significant effect on spending per capita.

Table 3: The impact of APE in the care for the elderly sector
OLS-estimates with robust standard errors in parentheses

	Spending per capita	Coverage - home based care	Coverage - institutions	Share of single rooms
Specially adapted dwellings	27.465	0.0057	-0.00298**	0.01041**
	(23.151)	(0.0034)	(0.00092)	(0.00228)
Nursing homes	47.364*	0.0018	-0.00083	0.01541**
	(19.764)	(0.0021)	(0.00106)	(0.00193)
Change in per capita revenues	-0.0023	0.0006	0.00143*	0.00382**
	(0.016)	(0.0025)	(0.00060)	(0.00131)
Change in share 0-5 years	-10.606	1.9331	0.27603	-1.14294
	(9.794)	(1.2371)	(0.55827)	(1.05316)
Change in share 6-15 years	-18.184*	0.2090	-0.02471	-0.76431
	(8.478)	(1.1030)	(0.34905)	(0.82852)
Change in share 80 years and above	17.387	-10.4411**	-2.65589**	-3.10686*
	(14.680)	(1.8312)	(0.50930)	(1.38117)
Observations	424	428	429	423
Adjusted R-squared	0.033	0.103	0.07925	0.16658
Period	1997-2005	1997-2005	1997-2005	1997-2005

Robust standard errors in parentheses
** p<0.01, * p<0.05

In Table 4 we investigate whether APE had any adverse impacts on services for the young. It appears that the educational sector was largely unaffected by APE. Neither of the two utilization variables comes out as significant. In the child care sector on the other hand, utilization of APE is associated with lower coverage. When change in revenues is included as the only control, both utilization variables come out as significant and with the expected negative sign. When we also control for the age composition of the population, *NH* is still highly significant, while *SAD* is only borderline significant.

Table 4: The impact of APE on services for the young
OLS-estimates with robust standard errors in parentheses

	Teacher hours per pupil		Child care coverage	
	A	B	A	B
Specially adapted	-0.084	-0.078	-0.00254*	-0.00233
dwellings *(SAD)*	(0.139)	(0.136)	(0.00119)	(0.00119)
Nursing homes	0.132	0.119	-0.00224*	-0.00231*
(NH)	(0.113)	(0.110)	(0.00100)	(0.00099)
Change in per	0.120	0.167	0.00187	0.00205
capita revenues	(0.127)	(0.129)	(0.00100)	(0.00111)
Change in share 0-5		-183.141**		-1.324*
years		(70.667)		(0.590)
Change in share 6-		-296.954**		-0.891
15 years		(57.759)		(0.496)
Change in share 80		-1.937		-0.075
years and above		(86.294)		(0.705)
Observations	427	427	429	429
R^2_{adj}	0.0025	0.101	0.025	0.04
Period	1997-2005	1997-2005	1997-2005	1997-2005

Robust standard errors in parentheses
** p<0.01, * p<0.05

The estimated coefficients of the APE variables on child-care are around -0.002, which means that one extra dwelling per 1000 inhabitant is associated with a reduction in child care coverage by 0.2 percentage point. For the local government with the largest utilization of APE the predicted reduction in child-care coverage due to APE is 7-8 percentage points. For a local government with average utilization the effect is nearly 2 percentage points. Although the quantitative effects are sizeable, they are small compared to the increase in child-care coverage during the period under study. On the national level, child care coverage increased by 15 percentage points from 1997 to 2005.

The service provision for the young is also affected by local government revenues and demographics. Higher revenues are associated with higher child-care coverage and to some extent also an increase in teacher hours per pupil. Regarding demographics, there is some evidence that there is disadvantage of being part of a large cohort. An increase in the share of children 6-15 years of age is associated with a reduction in teacher hours per pupil and an increase in the share of children 0-5 years of age is associated with lower child-care coverage. This finding is in line with a large literature analyzing the impact of demographic change on public spending, e.g. Poterba (1997), Harris et al. (2001), and Borge and Rattsø (2008). But in

contrast to some of these studies, we find no evidence that an aging population threatens spending for the young.

The impacts of APE on budgetary balance are displayed in Table 5. In this case the two utilization variables have very different effects. Investment grants related to specially adapted dwellings has no systematic effect on the budgetary balance, while there is strong evidence that investment grants related to nursing homes have reduced the operating surplus. The point estimate indicates that one extra investment grant for nursing homes will reduce the net operating surplus by around NOK 140, while the impact on the gross operating surplus is NOK 107. This means that up to 30% of the reduction in the net operating surplus may be due to increased interest payments and debt servicing costs related to the investment, while most of the effect goes through current expenditures.

The average local government received investment grant for 4 dwellings in nursing homes. For this average local government APE contributed to a reduction in the net operating surplus by NOK 560 per capita. This is effect is quite sizeable and amounts to 1.4% of average per capita revenues.

Table 5: The impact of APE on the operating surplus
OLS-estimates with robust standard errors in parentheses

	Gross operating surplus		Net operating surplus	
	A	B	A	B
Specially adapted dwellings *(SAD)*	47.82 (38.79)	48.10 (37.89)	-20.90 (77.01)	-19.74 (76.83)
Nursing homes *(NH)*	-107.60* (47.58)	-107.77* (47.42)	-144.36* (60.74)	-144.41* (60.45)
Change in per capita revenues	400.68** (70.02)	402.95** (71.25)	273.20** (73.82)	279.11** (70.36)
Change in share 0-5 years		-1,950.50 (20,567.55)		-4,638.18 (23,666.41)
Change in share 6-15 years		-301.74 (17,386.47)		-2,571.74 (19,547.58)
Change in share 80 years and above		-9,238.03 (27,357.53)		-23460.43 (36,103.85)
Observations	413	413	429	429
R^2_{adj}	0.396	0.392	0.154	0.150
Period	1997-2005	1997-2005	1997-2005	1997-2005

Robust standard errors in parentheses
** p<0.01, * p<0.05

The change in per capita revenues is the control variable with strongest impact on the change in the net operating surplus. A revenue increase of NOK 1000 will increase the net operating surplus by around NOK 275. This quantitative effect is in line with an earlier analysis of budget deficits in Norwegian local governments by Borge (2005). The operating surplus seems to be unaffected by demographic change.

From the above analyses we find that the utilization of APE has an impact on the services for the young, the budgetary deficit as well as in the elderly sector. Utilization of APE through investment in nursing homes seems to be significant, and leads to increased spending in care for the elderly through an increase in share of single rooms in institutions as well as increased operating expenditures. Looking at the services for the young, we find a negative impact of investing in *NH* on coverage in child-care. Last, we find an increase in budget deficits as a result of utilizing APE.

To address the econometric challenges related to analyzing the utilization of APE we use the initial share of population in rural areas and the initial share of elderly as instruments. As the significant results in the above analyzes are related to nursing homes, we focus our IV analyzes on nursing homes.

Table 6: IV regression results. Nursing homes instrumented by population in rural areas and the share of elderly.

	Spending per capita in elderly care	Teacher hours per pupil	Child care coverage	Gross operating surplus	Net operating surplus
Nursing homes *(NH)*	329.70** (79.84)	-1.155* (0.569)	-0.0296** (0.0068)	-377.365** (125.527)	-212.99 (126.85)
Change in per capita revenues	0.006 (0.023)	0.168 (0.157)	0.0012 (0.0023)	400.90** (69.478)	272.65** (65.54)
Change in share 0-5 years	-2.69 (13.23)	-222.21* (87.101)	-2.134 (1.146)	-7,698.57 (22,680.46)	-6,180.51 (24,284.05)
Change in share 6-15 years	-17.98 (11.20)	-303.19** (66.84)	-0.936 (0.884)	-3,811.25 (18,133.17)	-720.69 (18,298.84)
Change in share 80 years and above	17.84 (19.12)	-5.50 (104.05)	-0.184 (1.432)	-12472.22 (28,114.37)	-24287.33 (34,539.12)
Observations	424	427	429	413	429
First stage F-stat	14.19	14.45	14.10	14.49	14.10
HansenJ pval	0.839	0.244	0.962	0.524	0.755

Robust standard errors in parentheses
** p<0.01, * p<0.05

Compared with the OLS results, we find larger and more significant results when we instrument investments in nursing homes with the population in rural areas and the share of elderly. The effect of *NH* on net operating surplus, on the other hand, is no longer significant. Evaluated for the average utilization of *NH*, we find that this leads to an increase in care for the elderly spending per capita by 1300 NOK, a reduction in teacher hours per pupil by 4.6, and a reduction in child-care coverage by 11.8 percentage points. The F-value for the first stage is around 14 for the various specifications, which suggest that the instruments do a good job of explaining utilization of APE.

Another concern is that our results are due to trends in spending and deficits prior to the implementation of APE in 1998. To address this, we analyze the impact of APE before 1997. The results in Table 7 show no significant estimates of utilization of APE on budgetary

balance, services for the young or spending per capita in elderly care. This supports that the utilization of APE are not related to trends in spending and deficits prior to 1997.

Table 7: Impacts of APE before 1997.

	Spending per capita in elderly care	Teacher hours per pupil	Child care coverage	Gross operating surplus	Net operating surplus
Specially adapted dwellings	14.1 (12.7)	-0.085 (0,15)	-0.001 (0.001)	50.8 (36.0)	8.1 (31.2)
Nursing homes	-2.820 (10.07)	0.125 (0.117)	-0.001 (0.0007)	25.8 (28.7)	69.2 (59.7)
R^2	0.05	0.05	0.04	0.09	0.122
Observations	427	426	433	413	433
Period	1991-1996	1992-1996	1990-1996	1991-1996	1991-1996

Robust standard errors in parentheses
** p<0.01, * p<0.05

5. Concluding remarks

The purpose of this paper was to investigate whether the Action Plan for the Elderly (APE) had unintended consequences for the budget deficit and services for the young. The main financial element in APE was a temporary investment grant of a matching type. This type of grant is likely to have adverse effects for other services and the budgetary balance. We investigate whether APE had such adverse effects using a difference-in-differences approach. We find evidence that APE increased the share of single rooms in nursing homes and spending on care for the elderly, but reduced the growth in child-care coverage and increased the budget deficit. Use of instruments and analyzes of the pre-APE period do not indicate that the effects are spurious.

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